BASIS FOR THE AMENDMENT

The claims have been amended in a manner so as to obviate their asserted indefiniteness, consistent with the disclosure and the Examiner's kind suggestions. No new matter has been introduced thereby.

REMARKS

Favorable reconsideration of this application is requested.

Claims 1-9 are in the case. They stand rejected under 35 U.S.C. §103(a) as being unpatentable over Mohring '350 or '936 in view of Wagner '127 or '622 and Hennig.

The interview kindly granted by the Examiner, Mr. Sergent, on August 6, 1998, is hereby acknowledged with appreciation. It served to materially advance the prosecution of the case by clarifying the issue. Specifically, for reasons as urged at said interview set forth and further elaborated upon below, the Examiner stated that he will reconsider his position.

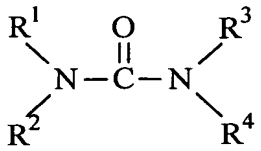
The invention relates to a process for the preparation of a polyisocyanate which contains one or more biuret groups by reacting

a) an aliphatic or cycloaliphatic isocyanate containing two or more isocyanate groups (isocyanate a) with

b) .a tertiary alcohol or a mixture of water and a tertiary alcohol (biuretizing agent b)

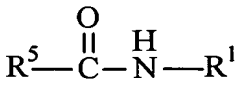
at from 100 to 250°C, which comprises carrying out the reaction in the presence

c) of a stabilizer (c) consisting essentially of a catalytic amount of urea, ammonia, biuret, a urea derivative of the formula I



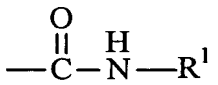
(I)

in which R^1, R^2, R^3 and R^4 are hydrogen, C_1 to C_{10} alkyl or C_6 to C_{10} aryl, or a carboxamide of the formula II



(II),

in which R^5 is C_1 to C_{12} alkyl which is unsubstituted or in which 1, 2 or 3 hydrogen atoms are replaced by a radical



As discussed in the specification, the biuret-containing polyisocyanate prepared by the known processes from tertiary alcohols and isocyanates leave much to be desired, since they are too dark in color for many applications and, in particular after prolonged storage, still include considerable quantities of readily volatile monomeric isocyanates.

Applicants have discovered an economic process by whose use it is possible to prepare biuret-containing polyisocyanates which are pale in color and whose contents of volatile isocyanates, particularly after prolonged storage, is low.

An essential feature of the claimed invention is the presence of a stabilizer (c) consisting essentially of a catalytic amount of a compound as defined. It is due to the presence of such component (c) as a catalyst, not as a biuretizing agent, in place of other known catalysts, such as those disclosed by Wagner at column 6, lines 30 to 42, that, unexpectedly, an improved product is obtained, as so factually demonstrated by the comparative evidence in the case. Note the results set forth for the products according to the Examples of the invention in Table 1 at page 9 of the specification compared to the results of the Comparative Examples in Table 2 at page 10 of the specification.

As is evident from the results set forth in these Tables, it is apparent that the products obtained by the claimed process evince significantly lower color numbers as well as their monomer content being significantly and materially lower.

In rejecting the claims over the cited references, it is the Examiner's position that it assertedly would be obvious to use the biuretizing agents of the secondary references in place of the amine component of Mohring, they allegedly functioning in an equivalent manner.

It is submitted that this is not a viable position. Component (c) in the claimed process is present as a catalyst in a catalytic amount, not being a biuretizing agent as so disclosed by the secondary references. Component (c) thus does not function as a biuretizing agent, as is the case in the subsidiary references being present only in a catalytic amount significantly and materially less than required for it to function as a biuretizing agent. Rather, component (c) in the claimed process is used in place of a catalyst as disclosed by Wagner resulting in unexpected improvements.

The reaction products of the claimed process are practically allophanate-free biurets even though a tertiary alcohol is used as a reagent therein. The reason for this is that during

the reaction in a first step a urethane is formed which in a second step is decomposed into an amine, CO_2 and an olefin. In a third step this amine forms urea with additional isocyanate and finally this urea forms biuret with additional isocyanate. Note, page 2, lines 1 to 5 of the specification. Since during the process the amine is formed in situ, no amine has to be introduced initially.

Möhring teaches a process for the formation of allophanate containing biurets (see '350, column 3, line 41 and '936, column 3, line 44) from an isocyanate, a primary or secondary alcohol and an amine. During this reaction the primary or secondary alcohol reacts with isocyanate to form a urethane. Since this urethane is more stable than that made from a tertiary alcohol it does not decompose and forms an allophanate with additional isocyanate. Therefore the amine must be introduced initially because otherwise urea and consequently biuret could not be formed. The process of Möhring thus clearly is significantly and materially different from the claimed invention.

Further, the comparative evidence in the case discussed above is a direct comparison with Wagner, clearly the closest prior art. Note that the biuretizing agents of Wagner and Hennig react with the polyisocyanates, they not functioning nor being present in catalytic amounts solely to improve the biuretization. Consistent with the Examiner's kind suggestion at said interview, the claims thus have been amended to make it clear that component (c) consists essentially of a catalytic amount of the defined component, thereby precluding the additional presence of a catalyst as disclosed by Wagner.

Accordingly, withdrawal of the rejection of the claims under 35 U.S.C. §103 is requested.

With regard to the rejection of the claims under 35 U.S.C. §112, first and second paragraphs, they have been amended in a manner believed to obviate this rejection taking the Examiner's criticisms and kind suggestions into consideration.

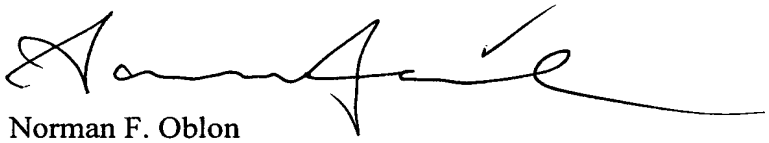
Should any further amendment to the claims be considered necessary by the Examiner, he is requested to telephonically contact the undersigned so that mutually agreeable language may be arrived at.

Withdrawal of the rejections of the claims under 35 U.S.C. §112, first and second paragraphs, thus is requested.

It is submitted that the claims define a patentable invention. Their allowance is solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



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